

# **FACT SHEET**

**Proposed Relicensing of  
The Dow Chemical Company  
Salzburg Landfill  
Hazardous Waste Disposal Facility**

**Midland, Michigan**

**MID 980 617 435**

**November 3, 2008**



**Michigan Department of Environmental Quality  
Waste and Hazardous Materials Division**

## **BASIS FOR PROPOSED HAZARDOUS WASTE MANAGEMENT FACILITY RENEWAL OPERATING LICENSE ISSUANCE**

The Michigan Department of Environmental Quality (MDEQ), Waste and Hazardous Materials Division (WHMD), proposes to reissue a hazardous waste management facility operating license (License) to The Dow Chemical Company (Dow), Michigan Operations, for the continued operation of the Salzburg Landfill hazardous waste disposal facility located at 2314 West Salzburg Road in Midland, Michigan. The U.S. Environmental Protection Agency (U.S. EPA) is not proposing to issue a federal permit to the company authorizing continued operation because there are no federal hazardous waste program provisions that the MDEQ is not authorized for at this time. Section I of this Fact Sheet describes the state and federal programs established to regulate hazardous waste and to permit hazardous waste treatment, storage, and disposal facilities.

The provisions of R 299.9518 of the administrative rules promulgated pursuant to Part 111, Hazardous Waste Management, of the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451), require the MDEQ to deny an application for a License for the following reasons:

1. The facility has not been constructed according to the plans approved by the MDEQ, the requirements of Part 111 of Act 451 or its rules, or the stipulations and conditions of the approved construction permit.
2. The construction or operation of the facility presents a hazard to public health or the environment.
3. The applicant has not submitted sufficiently detailed or accurate information to enable the MDEQ to make reasonable judgments as to whether the License should be granted.

Based on the review of the Dow License renewal application and numerous site inspections and audits, MDEQ staff proposes the License be issued based on the following conclusions:

1. The facility has been constructed and operated in accordance with approved plans and applicable rules. Section II of this Fact Sheet describes the site, facility design, prior licensing, and MDEQ audit activities.
2. The facility does not at this time present a hazard to human health or the environment. This conclusion is based on environmental monitoring of air and groundwater conducted by Dow and audited by the MDEQ, and compliance inspections conducted by MDEQ staff. Section III of this Fact Sheet describes the waste that may be managed at the facility and the environmental monitoring conducted by Dow.
3. The License renewal application submitted by Dow is sufficiently detailed to demonstrate that the facility's design and operation complies with the applicable technical standards. In addition to the standard and general facility operating conditions contained in all Licenses, the draft License contains conditions specific to Dow's disposal activities. A summary of these conditions is included in Section II.C. of this Fact Sheet. The portions of the License application that describe in detail how Dow will comply with certain regulations have been attached to the draft License as enforceable documents. Such attachments include, but are not limited to, the Waste Analysis Plan, Inspection Schedule, Personnel Training Program, Contingency Plan, Closure Plan, Postclosure Plan, and Environmental Monitoring Programs Sampling and Analysis Plan.

Dow has been found to be out of compliance with certain provisions of Part 111 during its operating life as summarized in the Compliance Summary prepared by the MDEQ and the Corrective Action section from Dow's License application, both included in Attachment 1 to this Fact Sheet. The Compliance Summary summarizes the inspections conducted by the MDEQ since issuance of the previous state License in 1987. The Corrective Action section from the License application describes the Consent Orders/Agreements and activities related to resolution of historical compliance issues associated with operation of the landfill. Dow has generally been responsive in correcting the violations that have been cited and is currently operating in compliance with Part 111.

Although the MDEQ believes it has done a thorough job of reviewing the Dow application for the License, the MDEQ is seeking public input on the issuance of this License. This ensures that the MDEQ will benefit from any information the public may have relevant to the proposed action. Section IV of this Fact Sheet describes the public participation process.

## **I. INTRODUCTION**

Part 111 was passed by the Michigan Legislature to regulate the management of hazardous waste from generation to disposal. Likewise, Subtitle C of the Solid Waste Disposal Act, as amended, Title 42 of the United States Code, Section 6901, *et seq.* (commonly known as the Resource Conservation and Recovery Act of 1976, as amended [RCRA]), was passed by the U.S. Congress to regulate hazardous waste nationwide. The RCRA was amended substantially by the Hazardous and Solid Waste Amendments of 1984, as amended (HSWA).

Both the RCRA and Part 111 establish a permit system governing the treatment, storage, and disposal of hazardous wastes. The RCRA allows the states to obtain authorization to issue a state hazardous waste management facility operating license in lieu of a federal permit. Effective December 27, 1985, the state of Michigan amended its hazardous waste management administrative rules to be equivalent to those under the RCRA and applied to the U.S. EPA for authorization. In October 1986, Michigan was granted authorization to administer all portions of the RCRA Program, except those under the HSWA. Subsequently, Michigan received authorization for all of the HSWA provisions promulgated through July 28, 2006, including the corrective action program that was initially authorized on April 8, 1996. Since Michigan is authorized for all of the applicable HSWA requirements, it will not be necessary for the U.S. EPA to issue a companion HSWA permit with the state License.

The duration of the state License will be ten years. Because the landfill regulated under the License is a "land disposal facility," it contains a provision that allows the MDEQ to review the License after five years to determine if any modifications are necessary.

## **II. DESCRIPTION OF THE FACILITY**

### **A. Site Description and Prior Licensing**

The 152-acre site for the Dow Salzburg Landfill facility is located at 2314 Salzburg Road in the city of Midland, Midland County, Michigan, southwest of the intersection of Waldo and Salzburg Roads in Section 35, T14N, R2E. The general geographic location of the site, site boundaries, topography, buildings, and support facilities are shown in the figures in Attachment 2. The landfill facility development plan and general design are shown in the figures in Attachment 3. The landfill is located less than a mile from the

1,900-acre Dow Michigan Operations industrial manufacturing and research facility and is designed and used for disposal of hazardous and nonhazardous waste from that facility. Dow Michigan Operations manufactures plastics, agricultural chemicals, organic chemicals, inorganic chemicals, and conducts research and development activities for the manufacture of these products.

Wastes are transported to the landfill site in trucks and are not accepted for landfilling unless the wastes are placed in closed containers or otherwise totally contained or covered during transportation. No treatment or storage of hazardous waste occurs at the landfill. The fenced and gated landfill facility consists of closed and active waste disposal cells, paved roads, buildings that contain a vehicle wash area, spare parts, utilities, lunch room, locker room, and office, soil and equipment stockpile areas, perimeter screening berms, and environmental monitoring equipment. The types of waste disposed at the landfill consist primarily of incinerator ash, contaminated soil, dewatered sludges, asbestos, remediation materials, corrective action management unit eligible wastes, debris, and demolition rubble.

Under the U.S. EPA's Land Disposal Restrictions (LDR) program created by Congress in 1984, technology-based treatment standards for toxic constituents must be met (e.g., by incineration or other treatment) before hazardous waste can be placed in a landfill. These standards were devised to minimize short- and long-term threats to human health and the environment. All hazardous wastes disposed at the landfill are required to meet the LDRs under Title 40 of the federal Code of Regulations (CFR), Part 268, unless they qualify for the Dow site-specific LDR treatability variance that was approved by the MDEQ on July 2, 2008. The variance is applicable to contaminated soils, including those contaminated with dioxins and furans, exhibiting a hazardous waste characteristic or containing listed hazardous waste generated during corrective action or as a result of upgrade or maintenance of corrective action management systems, including Dow's Michigan Operations Revetment Groundwater Interception System.

All wastes placed in the landfill are overlaid with daily cover by the end of the day. Traffic routes around the cells are paved in order to minimize airborne particulates emanating from the fence line. At the time the landfill was issued its first License, the capacity of the landfill was estimated to last until the year 2017. Due to waste minimization efforts, Dow currently estimates that the landfill will have original capacity through the year 2062.

The License authorizes the continued operation of the hazardous waste landfill and related appurtenances (piping, pumps, operation and maintenance buildings, etc.). Hazardous and solid waste Cells 1-19 and 38-43 have been filled with waste and subsequently closed. During their operation, solid waste Cells 38-43 were permitted pursuant to Part 115, Solid Waste Management, of Act 451. Since those cells were closed, compatible solid wastes have been co-disposed with hazardous wastes and regulated under Part 111. However, a Part 115 perpetual care fund is required to be maintained for Cells 38-43 for a period of 30 years after final closure of the landfill in addition to the financial assurance requirements applicable pursuant to Part 111. Also, certain Part 115 groundwater monitoring program requirements for the closed solid waste cells have been meshed with those applicable to the landfill under Part 111. The table below summarizes the closed hazardous and solid waste disposal cells at the landfill.

<b>Cell Designation</b>	<b>Description/Year Closed</b>	<b>Approximate Cap Acreage</b>
Cells 1-2	Closed hazardous/solid waste cells/1984	1.9
Cells 3-5	Closed hazardous waste cells/1984	2.2
Cells 6-8	Closed hazardous waste cells/1986	1.7
Cells 9-10	Closed hazardous waste cells/1986	1.7
Cells 11-12	Closed hazardous waste cells/1986	2.5
Cells 13-14	Closed hazardous waste cells/1988	3.2
Cells 15-16	Closed hazardous waste cells/1991	3.5
Cells 17-19	Closed hazardous waste cells/2005	6.1
Cells 38-39	Closed solid waste cells/1988	4
Cells 40-43	Closed solid waste cells/2005	9.4

Cells 20-22 are the currently active cells. They are used for both hazardous and solid waste disposal and are approximately 7.2 acres in size. These cells have been in use since 2004. Hazardous/solid waste Cells 23-28 are in the early stages of construction at this time and will have an approximate size of 13.6 acres. Cells 23-28 are expected to be available for use in 2010.

The facility was previously issued a state construction permit on September 15, 1981, a state License on February 10, 1982, a state License on December 29, 1986, with an effective date of January 12, 1987, and a federal permit on December 31, 1986, with an effective date of January 12, 1987. The 1987 state License expiration date was January 12, 1992. However, the company submitted a timely reapplication and has, therefore, been allowed to continue operating the landfill under the conditions of the License referenced above until the new License is issued. This extension is allowed by 1969 PA 306, as amended, under the Michigan Administrative Procedures Act.

State minor License modifications were issued on September 30, 1991 (Amendment 1), August 21, 2002 (Amendment 2), and August 8, 2007 (Amendment 4). A major License modification (Amendment 3) was issued on June 12, 2003. These modifications were made in order to update the facility's Waste Analysis Plan, to keep landfill waste codes current with those managed by the Dow Michigan Operations manufacturing plant, and to allow extended hours of operation, beyond those allowed under the 1981 construction permit, for disposal of certain remediation wastes.

As part of the renewal License, Dow's development plan for the landfill is being revised. Modifications proposed under the renewal License include:

- 1.. Increasing the final elevation of existing Cells 20-22 an average of four feet and maximum of eight feet;
2. Increasing the average height of the next set of cells, Cells 23-28, by 40 feet and a maximum height of 48 feet; and
3. The final elevation of future Cells 44-53 will not change significantly.

Increasing the height of these cells will not result in an exceedance of the authorized facility capacity of 3,090,000 cubic yards allowed under the 1981 construction permit nor will it encroach upon the rights-of-way for the high power electrical lines that cross the facility. However, due to this design change, the development of future Cells 30-37 will not be allowed unless Dow is able to add disposal capacity at a later date. Dow would

need to go through the construction permit process and obtain approval from the MDEQ in order to receive authorization to expand the landfill beyond its currently licensed disposal capacity.

## **B. Facility Design**

Overview The development plan for the landfill will be dependent upon waste generation rates and involves constructing future cells in phases that will optimize the construction cycle and the functional life of exposed geosynthetics. Future cell design will be subject to revision based on changes in regulations over time, as well as on updates to landfill technology and materials of construction; therefore, the License does not include detailed design plans for future cells, but instead incorporates general landfill cell design concepts. Dow will be required to obtain formal approval from the MDEQ prior to construction of all future cells, with the submittal of detailed design drawings, specifications, and calculations, consistent with past practice. The MDEQ is currently in the process of reviewing the detailed engineering design package for Cells 23-28 that was submitted on June 30, 2008.

The conceptual design information summarized below and shown on the engineering drawings in Attachment 7 of the License is applicable to Cells 23 through 28. These cells will be separated by small intermediate dikes, the height of which will be designed to accommodate a 24-hour, 100-year storm event with two feet of freeboard during the first phase of construction (first three waste lifts). The major components of cell construction, starting from the bottom and proceeding upward, are listed below.

1. Site Preparation and Subsurface Geology Determination;
2. Three-feet thick Secondary Compacted Clay Liner (CCL);
3. Secondary Synthetic Liner (60 mil high-density polyethylene [HDPE] geomembrane);
4. Leak Detection System (geocomposite – single bonded on the cell bottom and geocomposite – double bonded on the cell walls);
5. Five-feet thick Primary CCL;
6. Primary Synthetic Liner (80 mil HDPE geomembrane);
7. Leachate Collection System (geocomposite – single bonded on cell walls and granular drainage media with perforated HDPE pipes on the cell bottom); and
8. Lift Stations.

Site Preparation and Subsurface Geology Determination Preparing the site for construction involves excavation of the overlying soils and stockpiling them on site for future use. Topsoil will be used on future capping projects. Sandy soil will be used as daily cover material during landfill operations. Silts and silty clays will be used as clean fill material for future projects both on- and off-site. Clays meeting the project specifications will be excavated, stockpiled, and used as part of the clay liner for the cells or future capping projects.

Upon completion of the excavation, the cells are surveyed to insure that the proper subgrade elevations and slopes have been attained. The subsurface geology at the cell location is checked by soil borings and an earth resistivity and/or terrain conductivity survey. As required by Part 111, this confirms that six meters of soil having a hydraulic conductivity (permeability) no greater than  $1.0 \times 10^{-6}$  centimeters per second (cm/sec) is present below and laterally to the bottom liner of the cells.

An earth resistivity or terrain conductivity survey is performed along the perimeter and at various transect lines across the bottom of the cells and soil borings are made at various locations on the cell subgrade to a depth of at least six meters below the cell subgrade elevation. Soil samples from each boring are classified and permeability tested for correlation against the resistivity survey and/or terrain conductivity data. Once the subgrade has been verified to have the proper elevations, slopes, and subsurface geology, the actual cell construction may begin.

Secondary and Primary Compacted Clay Liners The secondary CCL is a minimum of three feet thick and the primary CCL is a minimum of five feet thick. The secondary CCL is constructed over top of the approved subgrade soils. The lifts of clay for the secondary CCL are spread with bulldozers and/or other suitable equipment. All clay lifts of the secondary CCL have a maximum uncompacted thickness of nine inches.

The primary CCL is constructed over top of the approved geocomposite drainage material in the leak detection system. The first lift of clay for the primary CCL is placed with low ground pressure equipment and has an uncompacted thickness of 15 inches. Each subsequent clay lift of the primary CCL has a maximum uncompacted thickness of nine inches.

The loose clay for each lift of both CCLs is broken up by a disc or other mechanical means and all visible stones and other debris greater than two inches in diameter are removed. Compaction is performed using vibratory or nonvibratory, padfoot or tined roller compactors. The clay is compacted to a minimum of 90 percent of its maximum dry density within 0 to +5 percent of the optimum moisture content as determined by the American Society of Testing and Materials (ASTM) D 1557, Modified Proctor Test. The top of each lift is scarified prior to placing clay for the next lift. The clay is ultimately constructed using appropriate equipment (e.g., backhoe, bulldozer, grader) to proper elevation then smooth-drum rolled with removal of any stones or hard objects to insure uniformity prior to the installation of the secondary or primary synthetic liners. This protects the synthetic liners against puncture from below during their installation or operation of the cell. After completion of the trimming operation, the entire surface of the CCL is surveyed to insure the specified slopes and elevations have been attained.

Equivalency The MDEQ allows an alternative equivalent design for the Part 111 requirements of:

1. A three-feet thick compacted clay secondary (bottom) liner with a maximum permeability of  $1 \times 10^{-7}$  cm/sec; and
2. Six meters of natural soils with a maximum permeability of  $1 \times 10^{-6}$  cm/sec below and lateral to the bottom liner.

The approved equivalent design is a 23-feet thick layer of natural soils immediately below the secondary synthetic liner having an average permeability of  $4.57 \times 10^{-7}$  cm/sec.

Secondary and Primary Synthetic Liners The secondary and primary synthetic liners (SSL and PSL), collectively referred to as geomembranes (GMBs). The GMBs are composed of HDPE. The SSL is 60 mils thick and the PSL is 80 mils thick. The GMBs are textured on both sides and are white on one side, with the white side installed upward.

The GMBs are installed by overlapping the individual sheets or panels and welding (or seaming) them together. After seaming, the GMB is anchored in a trench at the top of the dike. All of the production, detail, and patch seams are nondestructively tested and destructive testing is performed on production seams at a frequency of one test per 1,000 feet of seam and locations are picked at random by the quality assurance personnel.

Defective seams noted during nondestructive or destructive testing, along with any GMB defects (pin holes, nicks, gouges, etc.), found during the installation are repaired. All repairs are nondestructively tested and accepted if they pass. If not, the repair procedure is repeated until a passing test results.

Leak Detection System The leak detection system is located immediately above the secondary synthetic liner on both the bottom and the sidewalls of the cells and is composed of a geocomposite drainage material (GDM). The core of the GDM is a high-profile geonet. The GDM on the bottom of the cell has a geotextile (GTX) single bonded to one side (GDM-SB). On the sidewalls of the cell, the GDM has a GTX double bonded to both sides (GDM-DB) and is a nonwoven, needle punched material. The GDM panels are deployed with the machine direction pointing down slope to enhance flow characteristics. The adjacent panels of GDM are slightly overlapped and attached with plastic wire ties or approved equivalent. The top layer of GTX is sewn or heat bonded.

Leachate Collection System The leachate collection system is located immediately above the primary synthetic liner on both the bottom and the sidewalls of the cells. It is composed of a GDM-SB on the sidewalls and a granular drainage media/collection piping system on the bottom of the cells. The GDM-SB meets the same geonet and geotextile specifications as that used for the leak detection system. The installation requirements are also similar in manner. The GDM-SB is embedded in the granular drainage media at the toe of the sidewalls. The granular drainage media has a minimum thickness of 12 inches and a minimum permeability of  $1 \times 10^{-2}$  cm/sec. The collection piping is perforated HDPE pipe that is covered with a 12 to 18-inch envelope of pea stone that acts as a highly porous filter. The GDM-SB on the sidewalls of the cells will be exposed to the elements. A sacrificial layer of TX1200 will be placed over the GDM-SB to protect it from ultraviolet light degradation and weathering. The TX1200 is a 10 mil reinforced polyethylene liner. Small sections of the TX1200 will be removed just prior to placement of the waste in that area.

Lift Stations The leak detection system and leachate collection system have separate lift stations. Each set of future cells will have two leak detection system lift stations and two leachate collection system lift stations when completed. These will be placed on the side-slope rather than designed as vertical lift stations. The lift stations are constructed from solid wall and perforated HDPE pipe. Each lift station is equipped with a submersible pump, HDPE discharge piping, an automated level control device, a flow meter, and manual and/or automated valves. When liquid in either system reaches a predetermined level, the pump activates, and the liquid is pumped via a dual-contained HDPE pipeline in combination with an above-ground, visually inspected steel pipeline from the landfill to the sewer at the Dow Michigan Operations facility and ultimately to the Dow-owned and operated waste water treatment plant (WWTP).

Cap The major components of the future cap, starting from the bottom and proceeding upward, are listed below.

1. Site Grading and Subbase Preparation – 6- to 12-inch thick layer of sand or silty-clay soil installed on top of the daily cover material and graded, shaped and compacted to the proper slopes and elevations to provide a firm, smooth, uniform subbase for the clay liner;
2. Clay Liner Component - alternative equivalent design to be submitted for MDEQ review and approval consisting of a combination of a 1-foot thick CCL with a maximum permeability of  $1 \times 10^{-7}$  cm/sec covered with a single layer geosynthetic clay liner (GCL) instead of 3-feet thick CCL with a maximum permeability of  $1 \times 10^{-7}$  cm/sec;
3. Synthetic Liner Component - 40 mil HDPE geomembrane or 40 mil linear low density polyethylene geomembrane;
4. Drainage Collection Layer - GDM with a transmissivity of about  $6 \times 10^{-3}$  m<sup>3</sup>/m/sec installed immediately above the synthetic liner and composed of a high-profile geonet core with a GTX heat bonded to one side or both sides. The low ends of the GDM are embedded in a trench filled with pea stone and containing a HDPE perforated pipe that collects precipitation that percolates through the cover soil and into the GDM and directs it into the surface water drainage system at Salzburg Landfill;
5. Erosion Control and Freeze Protection Layer - over the geosynthetic layers will be an 18-inch thick cover soil layer composed of miscellaneous soil materials, such as sand, silt, or clay, topped with 6-inch thick layer of topsoil composed of fertile soil capable of supporting grass growth and graded to the specified elevations and slopes to provide positive drainage at all locations on the cap. Seed will be applied at 350 pounds per acre, fertilized, covered with mulch, and watered, if needed, until the grass germinates and grows to a length of two to three inches.

The detailed specifications and construction quality assurance requirements for each component of the cap will be addressed in the design documents submitted to the MDEQ for approval prior to construction.

Site Surface Water Management System The surface water management system for the facility was designed and constructed in 1986 and 1987, with runoff flow computations based on the U.S. Soil Conservation Service Methodology of May 1977 (24-hour, 25-year frequency storm). The design scenario assumed all possible cells at Salzburg Landfill were constructed, filled, and capped to estimate the peak design flow (i.e., essentially all precipitation falling on the site will become surface runoff, except for that which evaporates or is absorbed by the vegetation). While the facility is open and operational, any precipitation falling into the active cells becomes leachate that is pumped to the Dow WWTP thereby reducing the peak volume. The leachate collection system for Phase 1 of Cells 23 through 28, submitted to the MDEQ on June 30, 2008, was designed in accordance with Part 111 requirements to collect and control runoff from active portions of the cells for a 24-hour, 100-year frequency storm.

### **C. Facility-Specific License Conditions**

Parts II-V of the License contain facility-specific License conditions for operation of the facility as described below.

#### **Part II – General Operating Conditions**

Condition II.T., Site Review Board Limitation on Waste Acceptance, carries over a condition imposed by the Site Review Board in the 1981 construction permit and 1982 state License (Condition III.J.2.) that prohibits Dow from accepting waste at the facility between the hours of 3:00 p.m. and 5:00 p.m. and during times when hazardous driving conditions exist (i.e., when a hazard warning for the county of Midland has been issued by the Midland County Sheriff's Office).

The MDEQ is proposing to clarify that the prohibition on the acceptance of waste at the facility between the hours of 3:00 p.m. and 5:00 p.m. only applies to hazardous waste. This clarification has been made to the draft License and would allow Dow to accept remediation wastes that are classified as solid wastes during these hours. The MDEQ has conferred with Midland Public Schools (MPS) regarding this clarification and obtained concurrence on this License change.

The rationale for the clarification of this condition is as follows:

1. At the time the 1981 construction permit was issued, the Site Review Board was the final decision-maker on whether to grant or deny construction permits and whether to impose special conditions on the operation of new hazardous waste management facilities. As a result of statutory changes, the MDEQ Director is now able to make those decisions. Authority for issuance of state Licenses under Part 111 is currently delegated to the WHMD Chief.
2. Except during times when remediation projects are being conducted, wastes are generally only received at the Salzburg Landfill one day a week. Since the Salzburg Landfill was originally permitted, no significant transportation releases have occurred.
3. Since 1981 when the landfill was originally sited, Dow has purchased all the homes in the vicinity of the Salzburg Landfill, so bus stops near the landfill have been eliminated. In addition, traffic control devices on the roads were different; now there are four-way stop signs at the Waldo/Salzburg Road and Waldo/Saginaw Road intersections and a left turn lane off Saginaw Road onto Salzburg Road.

Dow has requested the MDEQ to also consider entirely eliminating the prohibition on acceptance of remediation waste that is classified as hazardous waste at the facility between the hours of 3:00 p.m. and 5:00 p.m., or as an alternative, on days when school is not in session. The MDEQ has not included this change in the draft License, but is accepting comment on Dow's request. Commenters should indicate whether the MDEQ should make this change or allow it on a case-by-case basis under a minor modification to the License. The MDEQ will consider any public comment received on Dow's request described above and confer with MPS before making a final decision on this matter.

Condition III.J.1. of the 1982 state License also included a Site Review Board limitation requiring Dow to provide an alternate water supply to users of water supplies that are actually or potentially contaminated by the operation of the Salzburg Landfill if determined necessary by the Director of Public Health (now known as the Department of Community Health). This condition is not being carried over to the draft License because Condition II.G. addresses any mitigation actions that are required in the event that an activity at the facility may present an imminent and substantial endangerment to human health or the environment pursuant to Section 11148 of Act 451.

### **Part III - Landfill Disposal Conditions**

Condition III.A., Coverage of License, specifies the design capacity of 3,090,000 cubic yards of the landfill and references the drawings that show the areal extent of the licensed disposal unit.

Condition III.B., Waste Identification and Quantity, specifies the total volume of 3,090,000 cubic yards of hazardous and compatible nonhazardous waste and references the list of acceptable waste types allowed for disposal in the landfill, as well as the classes of wastes that are prohibited.

Condition III.C., Design and Run-On, Runoff, and Contaminant Control, references the requirements for:

1. Liner system construction, design, and maintenance.
2. Operation and maintenance of the stormwater run-on and run-off control systems.
3. Cover to otherwise manage the landfill to control dispersal of particulate matter.
4. Operation and maintenance of a vehicle wash facility.
5. Dust and trackout control.
6. Operation and maintenance of a leachate collection and removal system.

Condition III.D., Waste Placement, references the requirements for management of ignitable, reactive, and incompatible wastes, wastes in containers, recording the location of each daily waste deposit, and periodic surveying to ensure that the final elevations of waste in the cells are not exceeded.

Condition III.E., Closure, specifies the requirements for disposal cell closure and final facility closure in accordance with engineering plans/specifications and the construction quality assurance plan in the approved Closure Plan. The license allows Dow to submit final detailed plans for placement of waste, dust and trackout control, runoff control, and slope stability of the waste and cap for MDEQ approval prior to placing waste above the top of dike elevation 629.0 U.S. Geological Survey (USGS) for future Cells 23-28 and 44-53. This will allow Dow and the MDEQ to account for any future design or regulatory requirements. This condition also specifies the closure event notification requirements to that MDEQ staff may be present to observe and/or take samples during the final cover placement activities. In addition, this condition requires facility benchmark surveys and cap elevation surveys of existing and newly-closed cells to be conducted to monitor the cap to ensure that excessive settling and subsidence that could affect the integrity of the cap does not occur.

Condition III.F., Additional Reporting, requires the submittal of an annual inspection and maintenance (e.g., mowing, fertilization, and liming) summary report to the MDEQ by March 1 of each year during the active life of the landfill and the postclosure care period.

## **Part IV – Environmental Monitoring Conditions**

The environmental monitoring programs required under the License are listed below and summarized further in Section III of this Fact Sheet, Environmental Impact. Attachment 9 of the License, Sampling and Analysis Plan, contains all of the details for conducting environmental monitoring of the landfill.

- Condition IV.A., Groundwater Monitoring Program
- Condition IV.B., Ambient Air Monitoring Program
- Condition IV.C., Soil Monitoring Program
- Condition IV.D., Surface Water Monitoring Program
- Condition IV.E., Leachate Monitoring Program
- Condition IV.F., Leak Detection System Monitoring Program

It should be noted that gas vent monitoring and odor control requirements were not carried over from the previous License to the renewal License based on minimal gas generation rates previously documented from the types of waste disposed and the lack of odor complaints regarding the facility. Any odor complaints would result in appropriate follow-up, in conjunction with the MDEQ, Air Quality Division, as necessary.

## **Part V – Corrective Action Conditions**

Condition V.C. of the License identifies the waste management units (WMUs) at the facility as well as requiring a notification to the MDEQ within 30 days of discovery of a new WMU or a release of a contaminant from a new WMU. At the time of relicensing, none of the WMUs require the implementation of corrective action activities. The remaining conditions in Part V of the License specify the requirements and process for conducting corrective action for any releases from WMUs that require remediation.

## **III. ENVIRONMENTAL IMPACT**

### **A. Wastes Stored, Treated, and Disposed**

The hazardous wastes that can be disposed at the landfill by Dow are included in Attachment 8, List of Acceptable Waste Types, of the License. At the nearby Dow Michigan Operations manufacturing plant, Dow stores and treats in an on-site incinerator and WWTP an extensive universe of hazardous and compatible nonhazardous wastes generated both on-site and at off-site Dow facilities and subsidiaries. Wastes from many manufacturing processes, solids from the WWTP, and certain contaminated soils from remediation projects must be incinerated in order to reduce the toxicity and meet the LDRs prior to landfilling. As indicated previously, the bulk of the wastes disposed at the landfill is comprised of incinerator ash and remediation wastes.

### **B. Groundwater Monitoring**

Dow will continue to conduct groundwater monitoring at the facility to evaluate whether hazardous constituents from the regulated units (closed and active solid and hazardous waste landfill cells) have entered the groundwater below the waste management areas. Groundwater and leachate constituents included in the Part 115 monitoring plan were

taken into account and certain constituents were selected as part of the program proposed for monitoring groundwater at the landfill under the draft License.

The groundwater monitoring program consists of two detection monitoring programs, one for the glacial till aquifers and the other for the regional aquifer. The detection monitoring program for the glacial till aquifers includes 17 monitoring wells that are sampled and chemically analyzed 2 times a year and the detection monitoring program for the regional aquifer includes 3 monitoring wells that are sampled and chemically analyzed 2 times a year. Chemical monitoring parameters includes volatile and semivolatile organics, total organic carbon, dissolved metals, anions/cations. The purpose of both detection monitoring programs is to determine if hazardous waste or hazardous waste constituents have been released to the groundwater. In addition, a hydraulic monitoring program is conducted on the three regional aquifer chemical monitoring wells plus a fourth regional aquifer well that is used only for hydraulic monitoring. Hydraulic monitoring consists of static water elevation data collection at these four wells to track groundwater flow direction.

As part of the Part 115 requirements addressed in the draft License, the groundwater monitoring program includes provisions for evaluating groundwater geochemistry tracking parameters over time to determine if operational changes to dust control activities at the landfill are resulting in the reduction of the concentration of parameters in the groundwater associated with historical road brining activities.

Further, issuance of the draft License will provide final resolution of a 1983 compliance incident involving the siphoning of leachate from a gravel bed located in the leachate collection lines from Cells 6-8 via a leachate collection sump into a liner leak detection sump due to faulty manhole connections/pumping. The License resolves this issue by allowing Dow to cease monitoring of the gravel bed flush system for tracer dye based on the organic constituents being nondetectable since 1985 and dye concentrations being consistently low for several years.

### **C. Ambient Air Monitoring Program**

Dow will continue to monitor ambient air quality at three stations around the perimeter of the site. Samples collected from the stations will be analyzed for total suspended particulate every six days. Ambient air monitoring data is reported to the MDEQ, Air Quality Division, and the WHMD. Based on reviews of past monitoring results, the MDEQ has approved a reduction in the constituents monitored in the ambient air. Historically, more extensive ambient air monitoring was conducted (e.g., metals were previously monitored and a limited dioxins and furans monitoring program was conducted while dioxin-contaminated Tertiary Pond wastes from a remediation project were being disposed in the landfill ).

### **D. Soil Monitoring Programs**

Dow will continue to conduct annual soil box monitoring for dioxins and furans at the landfill. Soil boxes are currently located at the main entrance to the landfill (on the northwest side of the facility), as well as on the internal haul road. The background soil box is located on top of the adjacent closed Sludge Dewatering Facility to the west of the landfill. The purpose of these programs is to verify that trackout of waste constituents is not occurring from the facility via truck traffic or blowing dust.

## **E. Surface Water Monitoring**

Dow will continue to conduct a quarterly surface water monitoring program to evaluate whether hazardous constituents have entered the surface water via leachate outbreaks or airborne particulates. Monitoring for total organic carbon, total metals, and anions will occur at three surface water outfalls (which ultimately discharge to the Tittabawassee River through surface water ditches).

## **F. Leachate Monitoring**

Dow will continue to conduct leachate monitoring to evaluate the type and concentration of hazardous constituents in leachate generated at the landfill. Chemical monitoring consists of a full leachate characterization (40 CFR 264, Appendix IX, including dioxins and furans) annually for active cells and every five years for closed cells starting in 2010. The results of this leachate characterization will be used to update the routine chemical monitoring target list for the groundwater and leak detection system monitoring programs. Leachate volumes are measured monthly and reported annually for active cells and are measured quarterly and reported annually for closed cells.

## **G. Leak Detection System Monitoring**

Dow will continue to conduct leak detection system chemical monitoring quarterly and volume monitoring monthly for all disposal cells to detect the quantity and quality of leakage of leachate through the primary liner of the disposal cells into the leak detection system sumps/lift stations. Due to the natural clay component of the primary liner above the leak detection system, some amount of liquids is expected to accumulate in these sumps/lift stations. The frequency of chemical monitoring may increase to monthly dependent on an increase in flow volumes. Chemical monitoring consists of analysis of a routine monitoring parameter list that is developed from the leachate characterization monitoring, including volatile and semi-volatile organics, total organic carbon, dissolved metals, and anions.

# **V. PUBLIC PARTICIPATION**

## **A. Public Comment Procedures**

The purpose of public participation is to ensure that the interested public has knowledge of the MDEQ proposed actions and to provide an opportunity to comment on those actions. In addition, the process ensures that the MDEQ has the opportunity to benefit from any information the public may have relevant to the proposed actions. Comments may be submitted in writing to the addressee listed in Subsection C between November 3, 2008 and December 19, 2008, or comments may be presented at the public hearing. The public comment and public hearing procedures that will be followed are stated in the Michigan Administrative Code, R 299.9514 and R 299.9515, and in 40 CFR, Sections 124.11 and 124.12.

The public hearing on the draft License will be held on Thursday, December 4, 2008, at the Grace A. Dow Memorial Library Auditorium located at 1710 West St. Andrews in Midland, Michigan. The hearing will begin at 7:00 p.m. and continue until all registered persons have had the opportunity to present their comments for the record. All persons attending the public hearing who intend to speak are requested to register by 7:30 p.m.

The public hearing location is accessible to handicapped persons. Any person requiring specialized accommodations or assistance, such as an interpreter for the deaf, meeting materials in Braille, large print, or on audio tape, should contact Ms. Lindacarol Leiter at the MDEQ address given in Section V.C. of this Fact Sheet or at 517-373-9875 before November 21, 2008.

After the public hearing and the close of the public comment period, the MDEQ will decide whether, or not, to issue the final License. Written comments submitted during the public comment period and statements provided at the public hearing will be considered by the WHMD Chief in the formulation of the final decision. Responses to written comments and oral statements will be included in the record supporting the final decision of the MDEQ. The final License decision by the MDEQ will be communicated to the applicant, each person who submitted a written comment during the public comment period, persons providing oral statements at the public hearing, and all persons on the facility mailing list.

#### **B. Locations of Available Information**

The administrative record for the draft License is on file at the MDEQ, WHMD Office, located at Constitution Hall, Atrium North, 525 West Allegan in Lansing, Michigan (contact Ms. Cheryl Howe at 517-373-9881). In addition, copies of the draft License, the Fact Sheet, and the License Renewal Application are available for review at the MDEQ, Saginaw Bay District Office, WHMD, located at 503 North Euclid in Bay City, Michigan (contact Ms. Trisha Confer at 989-686-8025, Extension 8204); and the Reference Desk of the Grace A. Dow Memorial Library, located at 1710 West St. Andrews in Midland, Michigan (989-837-3449).

#### **C. Contact Person**

Address comments and requests regarding the draft License to:

Ms. Cheryl Howe  
Waste and Hazardous Materials Division  
Michigan Department of Environmental Quality  
P.O. Box 30241  
Lansing, Michigan 48909-7741

Written comments concerning the draft License should include the name and address of the writer, a concise statement of the basis for the comments, and the supporting relevant facts upon which the comments are based. All further requests for information, including requests for copies of the draft License or the Fact Sheet, should be made to Ms. Howe. Written comments must be postmarked no later than December 19, 2008.

Attachment 1

Compliance Summary

## Attachment 2

### General Geographic Location and Topographic Maps

Attachment 3

Landfill Facility Development Plan and General Design